US006345353B2

(12) **United States Patent**
Allen et al.

(10) **Patent No.: US 6,345,353 B2**
(45) **Date of Patent: Feb. 5, 2002**

(54) **STACK POINTER WITH POST INCREMENT/ DECREMENT ALLOWING SELECTION FROM PARALLEL READ/WRITE ADDRESS OUTPUTS**

(75) Inventors: **Stephen Allen**, Chandler; **Igor Wojewoda**, Phoenix, both of AZ (US)

(73) Assignee: **Microchip Technology Incorporated**, Chandler, AZ (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/772,653**

(22) Filed: **Jan. 30, 2001**

Related U.S. Application Data

(63) Continuation of application No. 09/356,720, filed on Jul. 20, 1999.

(51) **Int. Cl.**[7] **G06F 9/32**
(52) **U.S. Cl.** **712/202**; 711/219; 712/245
(58) **Field of Search** 711/219; 712/233, 712/245, 202

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,430,711 A * 2/1984 Anderson et al. 711/215
4,459,659 A * 7/1984 Kim 709/100
4,835,738 A * 5/1989 Niehaus et al. 711/154
5,023,828 A * 6/1991 Grundmann et al. 712/245
5,193,205 A * 3/1993 Matsuo et al. 712/239
5,287,309 A * 2/1994 Kai 365/189.04

* cited by examiner

Primary Examiner—Kenneth S. Kim
(74) *Attorney, Agent, or Firm*—Baker Botts L.L.P.

(57) **ABSTRACT**

The stack pointer is used for generating the next unutilized location in the stack memory device in order to indicate where a current value in the program counter is to be written. The stack pointer also generates a directly preceding location to the next unutilized location in order to read the last value of the program counter that was written to the stack memory device. The stack pointer will select the next unutilized location in the stack memory device for a write operation and the directly preceding location to the next unutilized location in the stack memory device for a read operation. The stack pointer will further perform either a post increment or post decrement operation on the next unutilized location in the stack memory device after execution of a current instruction.

8 Claims, 1 Drawing Sheet

